

# Robotic Tool for Asteroid Resource Prospecting and Characterization, Phase I

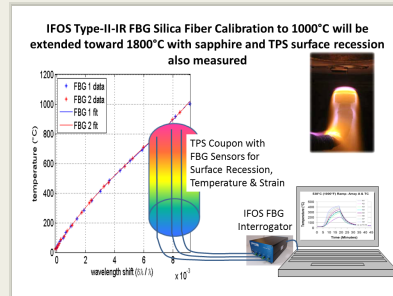
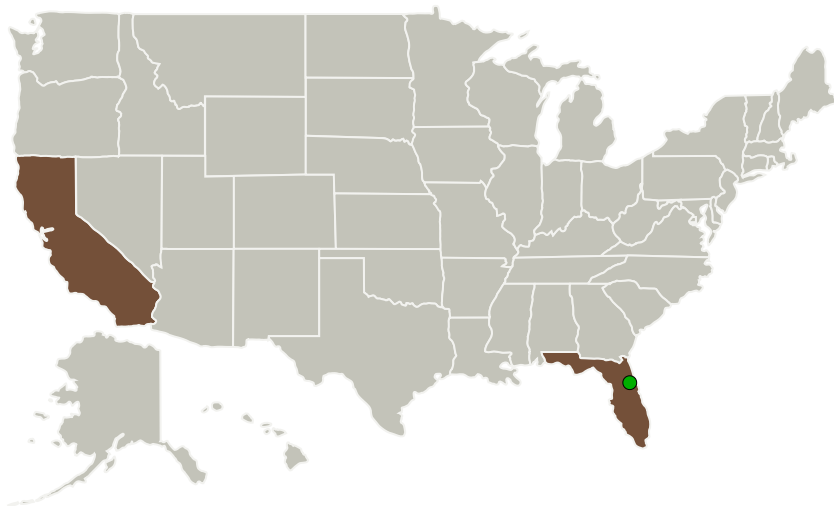
Completed Technology Project (2016 - 2017)



## Project Introduction

Optical fibers are inherently tolerant of cosmic radiation and a wide temperature range, immune to electromagnetic noise and thus solar flares, etc. Embedded fiber sensors can be highly resistant to shock and vibration, hence their usage in the oil drilling industry. IFOS will work with Stanford's Center for Design Research to develop a robotic prospecting tool with fiber-optic based haptic sensing (dynamic force, vibration, temperature) and capability to detect water, volatiles, metals, and organic compounds. A tool with in-situ analysis capabilities will allow preliminary prospecting to decide what samples are most worthwhile to collect, enabling sampling of a much larger area than one could afford to do otherwise. The prospecting tool will provide a basis for telegeology, where a field geologist can replay haptic display information it gathers. Phase 1 will develop a feasibility prototype with fiber optic haptic and water detection capabilities. Phase 2 will develop a full prototype.

## Primary U.S. Work Locations and Key Partners



Robotic Tool for Asteroid Resource Prospecting and Characterization, Phase I


## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

# Robotic Tool for Asteroid Resource Prospecting and Characterization, Phase I

Completed Technology Project (2016 - 2017)

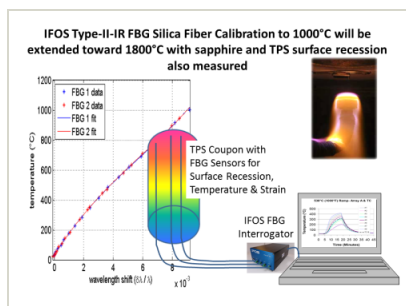


Organizations Performing Work	Role	Type	Location
Intelligent Fiber Optic Systems Corporation	Lead Organization	Industry	Santa Clara, California
 Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida
Stanford University Mechanical Engineering	Supporting Organization	Academia	Stanford, California

## Primary U.S. Work Locations

California	Florida
------------	---------

## Images



### Briefing Chart Image

Robotic Tool for Asteroid Resource Prospecting and Characterization, Phase I

(<https://techport.nasa.gov/image/135106>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Intelligent Fiber Optic Systems Corporation

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

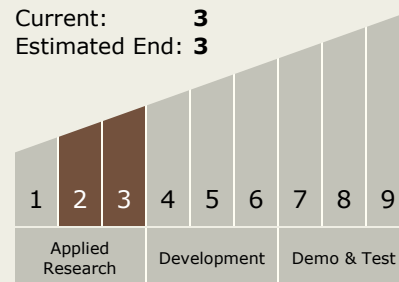
Richard J Black

## Technology Maturity (TRL)

Start: **2**

Current: **3**

Estimated End: **3**



# Robotic Tool for Asteroid Resource Prospecting and Characterization, Phase I

Completed Technology Project (2016 - 2017)



## Technology Areas

### Primary:

- TX07 Exploration Destination Systems
  - └ TX07.1 In-Situ Resource Utilization
    - └ TX07.1.1 Destination Reconnaissance and Resource Assessment

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System